Lesson 1: Addition and Subtraction Facts

Textbook pages: 30 – 31

**Lesson Objective**

To be able to understand the commutative law of addition and form a family of addition and subtraction facts.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Use it to stimulate discussions relating to commutative law. Ask pupils to find the total number of chairs for 6 blue chairs and 12 red chairs and to write an equation for the solution (6 + 12 = 18). Ask them whether the solution would be the same if there were 12 red chairs and 6 blue chairs. Would the equation be the same? (12 + 6 = 18) Guide pupils to see that both equations will give us the same answer. Try this with other sets of 2 numbers, and then 3 numbers. Help pupils conclude that when we add, the order of the numbers does not affect the answer.

Then ask pupils, now that we know the total, what can we do to find the number of blue chairs Will the equation be the same? Can we use the same numbers to make a subtraction equation? (18 – 12 = 6) What if we want to find the number of red chairs? What does the equation look like? (18 – 6 = 12) Guide them to see that with the same 3 numbers, we can form a family of addition and subtraction facts.

**Additional Activity**

After the In Focus task, ask pupils to work in pairs with 1–9 digit cards. One pupils draws two cards and writes an addition equation, while the other pupil writes the family of addition and subtraction facts. Then they use the family of facts to tell number stories. Pupils swap roles and repeat the activity.

**Misconceptions**

Pupils are unable to come up with a complete family of addition and subtraction facts.

**Formative Assessment**

Pupils can find the addition facts for any 2 numbers.
Pupils can find the subtraction facts for any 2 numbers.
Pupils can find the complete family of addition and subtraction facts for any 2 numbers.

**Non-Negotiable**

Pupils can find the complete family of addition and subtraction facts for any 2 numbers.

**National Curriculum**

Add and subtract numbers mentally.

**Resources**

* Whiteboards and pens (between two)
* 0–9 digit cards (between two)

# Lesson 2: Simple Adding

Textbook pages: 32 – 33

###### Lesson Objective

To be able to add a 3-digit number to ones without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask them how many ways they think they can solve this problem. Allow them some time to work on this. As they begin to show you one method, tell them your friend said that they could use a number bond diagram to show the process. What might this look like? What about a number line or number squares? Can we use Base 10 materials? Do we always get the same answer? Ask pupils what happens if the smaller number comes first? What if the question is 4 + 213? Does that change the method we use?

During Guided Practice, pupils are using a variety of methods to solve addition problems similar to the In Focus task.

**Misconceptions**

Pupils do not know the place value of ones and add the ones incorrectly.

**Formative Assessment**

Pupils can use a number line to add a 3-digit number to ones without renaming.
Pupils can use numbers squares to add a 3-digit number to ones without renaming.
Pupils can use Base 10 materials to represent numbers and add a 3-digit number to ones without renaming.
Pupils can use a number bond diagram to add a 3-digit number to ones without renaming.

**Non-Negotiable**

Pupils can add a 3-digit number to ones without renaming, using any method.

**Variation**

Example 1: Adding a 3-digit number to a 1-digit number using Base 10 materials, with pictorial support.
Example 2: Adding a 1-digit number to a 3-digit number, using a number line.
Example 3: Adding a 3-digit number to a 1-digit number, without pictorial support.
Example 4: Adding a 1-digit number to a 3-digit number, without pictorial support.

**National Curriculum**

Add and subtract numbers mentally, including a 3-digit number and ones.

**Resources**

* Blank number tracks (between two)
* Base 10 materials (between two)

# Lesson 3: Simple Adding

Textbook pages: 34 – 36

###### Lesson Objective

To be able to add a 3-digit number to multiples of 10 without renaming

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and ask them whether they can determine how many pupils are in the school hall. Allow them some time to work on this. Ask them if they can use any of the strategies they used in the previous lesson to help them today. How might they be helpful? How might they be different? Tell pupils your friend said he can find the total by counting on in tens. Is this possible? What does my friend mean? Can we show how to do this using a number line?

Ask pupils if they know how number bond diagrams might be helpful to add numbers like this. Provide them with time to work on this. Change the numbers and have them try this process again.

During Guided Practice, pupils are using different methods to solve addition problems.

**Misconceptions**

Pupils do not know the place value of tens and add the multiple of 10 incorrectly.

**Formative Assessment**

Pupils can count on to add a 3-digit number to a multiple of 10 without renaming.
Pupils can use Base 10 materials to add a 3-digit number to a multiple of 10 without renaming.
Pupils can use a number bond to add a 3-digit number to a multiple of 10 without renaming.

**Non-Negotiable**

Pupils can add a 3-digit number to a multiple of 10 without renaming, using any method.

**Variation**

Example 1: Using a number line to assist counting by tens.
Example 2: Adding a 3-digit number to a 2-digit number; suggests using Base 10 materials.
Example 3: Adding a 2-digit number to a 3-digit number, without pictorial support.
Example 4: Adding a 3-digit number plus a 2-digit number, without pictorial support.

**National Curriculum**

Add and subtract numbers mentally, including a 3-digit number and tens.

**Resources**

* Blank number tracks (between two)
* Base 10 materials (between two)

# Lesson 4: Simple Adding

Textbook pages: 37 – 38

###### Lesson Objective

To be able to add a 3-digit number to multiples of 100 without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and ask them how they might solve this problem. Allow them time to discuss. Ask if any of the methods they have used in the previous lessons might be helpful today. Provide them with a range of resources to use to solve this problem. After they have been working for some time, tell them your friend said that counting in hundreds would be helpful. What does my friend mean by that? How is counting in hundreds helpful? Allow pupils to discuss this and show a method that supports it.

Then show the class the second method – adding the hundreds. Use Base 10 materials to show the hundreds, tens and ones, then show how adding the hundreds will provide the answer. Use the number bond to illustrate the concrete representation.

During Guided Practice, pupils are adding numbers using a variety of methods.

**Misconceptions**

Pupils do not know the place value of hundreds and add the multiple of 100 incorrectly.

**Formative Assessment**

Pupils can count on to add a 3-digit number to a multiple of 100 without renaming.
Pupils can use Base 10 materials to add a 3-digit number to a multiple of 100 without renaming.
Pupils can use a number bond to add a 3-digit number to a multiple of 100 without renaming.

**Non-Negotiable**

Pupils can add a 3-digit number to a multiple of 100 without renaming, using any method.

**Variation**

Example 1: Counting on in hundreds.
Example 2: Adding the hundreds using Base 10 materials.
Example 3: Adding the multiple of 100 to a 3-digit number, no pictorial support.
Example 4: Adding the multiple of 100 to a 2-digit number, no pictorial support.

**National Curriculum**

Add and subtract numbers mentally, including a 3-digit number and hundreds.

**Resources**

* Base 10 materials (between two)

# Lesson 5: Simple Adding

Textbook pages: 39 – 41

###### Lesson Objective

To be able to add two 3-digit numbers without regrouping, using the column method of addition.

**Lesson Approach**

Pupils learnt the column method of addition in Year 2. In this lesson, help them to apply this knowledge to adding 3-digit numbers. Use this lesson to make sure any misconceptions are eradicated, especially for struggling learners.

To begin this lesson, show the class the In Focus task. Ask some pupils to demonstrate how the number 432 could be shown in terms of hundreds, tens and ones using Base 10 materials. Do the same for 521. Ask the class where we should begin when we want to add 521 to 432. Get them to add the ones, tens and then hundreds. Ask pupils if they can represent this addition using the column method. Give them time to write the column method and help struggling pupils to recall how to do this. Then ask pupils to explain why the addition always starts from adding the ones. Guide them to relate addition to the regrouping from ones to tens to hundreds.

During Let's Learn, emphasise the importance of placing digits with the same place value together when adding using the column method. Use Base 10 materials alongside the column method to better illustrate this.

During Guided Practice, the emphasis is on the column method.

**Misconceptions**

Pupils are not clear about place value and arrange numbers incorrectly when adding using the column method.

**Formative Assessment**

Pupils can use Base 10 materials to add a 3-digit number to another 3-digit number without renaming.
Pupils can use the column method to add a 3-digit number to another 3-digit number without renaming.
Pupils can use the column method to add a 3-digit number to a 2-digit number without renaming.
Pupils can use the column method to add a 3-digit number to a 1-digit number without renaming.

**Non-Negotiable**

Pupils can add a 3-digit number to a 3-digit number without renaming, using the column method.

**Variation**

Examples 1–2: Showing the change to the same number when adding only ones, multiples of 10 and multiples of 100.
Example 3: Adding a 3-digit number and a 2-digit number; adding two 3-digit numbers, using the column method.

**National Curriculum**

Add numbers with up to 3 digits, using formal written methods of columnar addition.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 6: Adding with Renaming

Textbook pages: 42 – 45

###### Lesson Objective

To be able to add a 3-digit number to ones with renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and ask them to discuss with their partners how they could add 8 to 236. Allow them to use Base 10 materials to get to the answer. Then ask them to share their answers and gather their methods. Show the class all the methods as illustrated in the textbook.

Method 1 is a bridging process using the expanded column method. It helps pupils to see the regrouping process and understand that the column method essentially adds by regrouping. This can be used for struggling learners who are not yet ready to move to the standard column method.

Method 2 is the standard column method. Use Base 10 materials as well as number bonds alongside the column method to make the method explicit. Compare the similarities between methods 1 and 2 so pupils can see the link between them. Method 3 uses knowledge of number bonds to make the next 10 and then add the remainder of the ones. It is important to go through all the three methods so that pupils get an understanding of the question and numbers, rather than just follow a procedure.

During Guided Practice, provide pupils with number cards to form the addition statements.

**Misconceptions**

Pupils are not clear about place value and arrange numbers incorrectly when adding using the column method.

**Formative Assessment**

Pupils can count on to add a 3-digit number to ones with renaming.
Pupils can use Base 10 materials to represent numbers and add a 3-digit number to ones with renaming.
Pupils can use number bond diagrams to add a 3-digit number to ones with renaming.
Pupils can use the column method to add a 3-digit number to ones with renaming.

**Non-Negotiable**

Pupils can add a 3-digit number to ones with renaming, using the column method.

**Variation**

Using digit cards to create addition facts with and without renaming.

**National Curriculum**

Add numbers with up to 3 digits, using formal written methods of columnar addition. Solve problems, including missing number problems, using number facts, place value and more complex addition.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 7: Adding with Renaming

Textbook pages: 46 – 51

###### Lesson Objective

To be able to add a 3-digit number to multiples of 10 with renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Using the digit cards 2, 7, 6 and 9, show pupils how to form a 3-digit number and a 1-digit number. Then combine the 0 digit card to the 1-digit number to form a multiple of 10, and add the 3-digit number to the 2-digit number. Ask pupils to work in pairs and create an addition statement for their partner to add. Then get the class back together to go through their different solutions.

Show Holly's addition statement: 692 + 70. Ask pupils, when using Base 10 materials and a place-value chart, what happens to the tens when there are more than 9 tens. Along with the Base 10 materials, show the expanded column method and help pupils link the column method to the concrete representation. Repeat this using Elliot's example: 792 + 60.

After going through these two examples (692 + 70 and 792 + 60), ask pupils to add the same numbers using the standard column method. Then ask them to add 297 and 60 using a number bond.

After practising addition using all the three methods, ask pupils to compare the 3 numbers – 692, 792 and 297. Guide them to use approximation: 692 is about 700, 792 is about 800 and 297 is about 300; then compare 700, 800 and 300. It will be much easier to see which number is greatest or smallest using this method. Help them to see that a 3-digit number with 9 tens is very close to the next hundred.

During Guided Practice, pupils are performing a similar task to the In Focus activity, with specific criteria around how to use the numbers.

**Misconceptions**

Pupils are not clear about place value and arrange numbers incorrectly when adding using the column method.

**Formative Assessment**

Pupils can count on to add a 3-digit number to a multiple of 10 with renaming.
Pupils can use Base 10 materials to add a 3-digit number to a multiple of 10 with renaming.
Pupils can use a number bond to add a 3-digit number to a multiple of 10 with renaming.
Pupils can use the column method to add a 3-digit number to a multiple of 10 with renaming.

**Non-Negotiable**

Pupils can represent the use of Base 10 materials in the column method of addition by adding the ones, the tens, then the hundreds, renaming where appropriate.

**Variation**

Example 1: Finding multiple ways of creating addition facts with specific numbers.
Example 2: Using estimation to determine the approximate total addition.

**National Curriculum**

Add numbers with up to 3 digits, using formal written methods of columnar addition. Estimate the answer to a calculation.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)
* 0, 2 and 4–9 digit cards (one set between two)

# Lesson 8: Adding with Renaming

Textbook pages: 52 – 54

###### Lesson Objective

To be able to add two 3-digit numbers with renaming the ones.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and ask them to use any of the methods they have previously learnt to add 236 and 345. Allow them to attempt a variety of ways to solve this. Focus on linking the concrete representation to the drawing of Base 10 materials and finally the standard column method.

Let pupils use the Base 10 materials to show the two 3-digit numbers. Ask them to tell you which to add first – hundreds, tens or ones – and whether any regrouping needs to be done. Help them to see that the regrouping of ones in the picture is the same as what they have done using Base 10 materials. Then show pupils the column method and ask them how to regroup the ones. Encourage them to use the standard column method. Guide pupils to understand that when adding using the column method, it is important to start adding the ones, then the tens, and then the hundreds, as the ones and tens may need to be regrouped.

During Guided Practice, pupils are practising column addition both with renaming and without.

**Misconceptions**

Pupils are not clear about place value and arrange numbers incorrectly when adding using the column method.

**Formative Assessment**

Pupils can use Base 10 materials to add a 3-digit number to another 3-digit number with renaming the ones.
Pupils can use the column method to add a 3-digit number to another 3-digit number with renaming the ones.
Pupils can use the column method to add a 3-digit number to a 2-digit number with renaming the ones.

**Non-Negotiable**

Pupils can use the column method to add two 3-digit numbers, with renaming the ones.

**Variation**

Adding using the column method.
Example 1: Two 3-digit numbers (a) renaming not required; (b) renaming the ones required.
Example 2: (a) Two 3-digit numbers, renaming not required; (b) a 2-digit number and a 3-digit number, renaming the ones required.
Example 3: A 2-digit number and a 3-digit number, renaming the ones required.

**National Curriculum**

Add numbers with up to 3 digits, using formal written methods of columnar addition.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 9: Adding with Renaming

Textbook pages: 55 – 57

###### Lesson Objective

To be able to add two 3-digit numbers with renaming the tens.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask them how many ways they know to solve this type of problem and allow them some time to work on this. Ask pupils to share their solutions.

Use Base 10 materials to go through the addition with the class. Focus on the regrouping of tens. Ask pupils what happens when 10 tens are regrouped. What is it called? Then place pictures of Base 10 materials alongside the standard column method. Emphasise the need to start adding from the ones. When no regrouping of ones is needed, we move on to add the tens. Pupils will realise that there is a need to regroup. Ask them how we can show the regrouping when using the column method. Guide them to apply their knowledge from regrouping the ones they learnt previously.

During Guided Practice, pupils are practising using the column method to add.

**Misconceptions**

Pupils are not clear about place value and arrange numbers incorrectly when adding using the column method.

**Formative Assessment**

Pupils can use Base 10 materials to add a 3-digit number to another 3-digit number with renaming the tens.
Pupils can use the column method to add a 3-digit number to another 3-digit number with renaming the tens.
Pupils can use the column method to add a 3-digit number to a 2-digit number with renaming the tens.

**Non-Negotiable**

Pupils can use the column method to add two 3-digit numbers, with renaming the tens.

**Variation**

Adding using the column method.
Example 1: Two 3-digit numbers (a) renaming not required; (b) renaming the tens required.
Example 2: (a) Two 3-digit numbers, renaming not required; (b) a 2-digit number and a 3-digit number, renaming the tens required.
Example 3: A 2-digit number and a 3-digit number, renaming the tens required.

**National Curriculum**

Add numbers with up to 3 digits, using formal written methods of columnar addition.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 10: Adding with Renaming

Textbook pages: 58 – 60

###### Lesson Objective

To be able to add two 3-digit numbers with renaming the ones and tens.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and provide them with the same set of digit cards. Read the problem to the class and ask them if they know what needs to be done. Ask them if they can find any clue in the problem that tells them what they have to do to find the solution. Introduce the term 'sum'. Pupils need to learn that the word 'sum' in mathematics means 'the total'.

Ask pupils if they know how to find the total of the two numbers. Ask them to form the numbers using the digit cards and arrange them using the column method. Then ask them to do the addition. Pupils will have to regroup twice, for the ones, and then for the tens. Guide them to apply their knowledge from what they have learnt previously using pictures of Base 10 materials.

**Additional Activity**

After the In Focus task, ask pupils to work in pairs to form two 3-digit numbers to practise adding using the column method. Ask them to record the pairs of numbers, which have a sum of less than 1000.

**Misconceptions**

Pupils are not clear how to regroup ones and tens.

**Formative Assessment**

Pupils can use Base 10 materials to add a 3-digit number to another 3-digit number with renaming the ones and tens.
Pupils can use the column method to add a 3-digit number to another 3-digit number with renaming the ones and tens.
Pupils can use the column method to add a 3-digit number to a 2-digit number with renaming the ones and tens.

**Non-Negotiable**

Pupils can add two 3-digit numbers, with renaming the ones and tens.

**National Curriculum**

Add numbers with up to 3 digits, using formal written methods of columnar addition.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)
* 2–4 and 7–9 digit cards (one set between two)

# Lesson 11: Simple Subtracting

Textbook pages: 61 – 62

###### Lesson Objective

To be able to subtract ones from a 2-digit number without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Allow them some time to solve the problem, with a variety of resources available to them. Ask them how many ways they think they can solve it. Help pupils to recall the methods 'counting back' using a number line and the number bond strategy. Allow them time to model each solution.

During Guided Practice, pupils are using a variety of methods to subtract mainly single digits from 2-digit numbers without regrouping.

**Misconceptions**

Pupils fail to recognise the key words in word problems and therefore complete the inappropriate operation.
Pupils start with the incorrect number in the equation and try to subtract a large number from a smaller number.

**Formative Assessment**

Pupils can use number bonds to subtract ones from a 2-digit number without renaming.
Pupils can use fact families to subtract ones from a 2-digit number without renaming.
Pupils can use a number line to count back.
Pupils can use number squares to count back.

**Non-Negotiable**

Pupils can subtract ones from a 2-digit number without renaming, using any method.

**Variation**

Example 1: Subtracting ones from a 2-digit number without renaming.
Example 2: (a) Subtracting ones from a 2-digit number without renaming; (b) subtracting ones and tens from a 2-digit number without renaming.

**National Curriculum**

Subtract numbers mentally.

**Resources**

* Blank number tracks (between two)
* Base 10 materials (between two)
* Number line to 100

# Lesson 12: Simple Subtracting

Textbook pages: 63 – 64

###### Lesson Objective

To be able to subtract ones from a 3-digit number without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask them if they know at least one way to solve this problem. Allow them some time to work on this. Tell them your friend said that she can use a number line to solve this problem. She would start with 658 and count on: 659, 660, 661, 662. Easy. Is she correct? Is some of what she said correct? What is the mistake here?

Allow pupils time to discuss the problems with her solution and fix it. Ask them if they know of any other ways to solve this problem. What about using Base 10 materials or the number bond method? Could either of these support subtraction here?

During Guided Practice, pupils are subtracting ones from 3-digit numbers without regrouping or renaming.

**Misconceptions**

Pupils fail to recognise the key words in word problems and therefore complete the inappropriate operation.
Pupils start with the incorrect number in the equation and try to subtract a large number from a smaller number.

**Formative Assessment**

Pupils can use number bonds to subtract ones from a 3-digit number without renaming.
Pupils can use fact families to subtract ones from a 3-digit number without renaming.
Pupils can use a number line to count back.
Pupils can use number squares to count back.

**Non-Negotiable**

Pupils can subtract ones from a 3-digit number without renaming, using any method.

**Variation**

Examples 1–2: Subtracting ones from a 3-digit number without renaming.

**National Curriculum**

Subtract numbers mentally, including: a 3-digit number and ones.

**Resources**

* Blank number tracks (between two)
* Number lines (increments marked) (between two)

# Lesson 13: Simple Subtracting

Textbook pages: 65 – 66

###### Lesson Objective

To be able to subtract multiples of 10 from a 3-digit number without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and ask them if they know of a fast way to solve this problem. Allow them some time to discuss which method they think would be the most efficient in solving this type of problem. What makes this problem slightly different from yesterday's problem? Are there any similarities? Give them time to discuss and try to solve it.

Tell them your friend said he would simply count backwards in tens. Would this work? How might that sound? What would it look like if we wrote it down? Allow them time to discuss and show their thinking. Then tell pupils you have another friend that said she could use Base 10 materials. Is this true? Can we subtract tens using those? How would that look? What if we wanted to record our thinking? Are we able to use number bonds to help us? How might that look?

During Guided Practice, pupils are looking for the connection between subtracting ones and tens from the same 3-digit number.

**Misconceptions**

Pupils fail to recognise the key words in word problems and therefore complete the inappropriate operation.
Pupils start with the incorrect number in the equation and try to subtract a large number from a smaller number.

**Formative Assessment**

Pupils can use number bonds to subtract multiples of 10 from a 3-digit number without renaming.
Pupils can use fact families to subtract multiples of 10 from a 3-digit number without renaming.
Pupils can count back in tens.
Pupils can use number squares to count back in tens.

**Non-Negotiable**

Pupils can subtract multiples of 10 from a 3-digit number without renaming, using any method.

**Variation**

Example 1: Seeing the relationship between subtracting a 1-digit number and then its multiple of 10
Example 2: Seeing the relationship between subtracting a 1-digit number and then its multiple of 10, leading to a zero in the tens column.
Example 3: Seeing the relationship between subtracting a 1-digit number and then its multiple of 10, leading to a zero in the ones column.

**National Curriculum**

Subtract numbers mentally, including a 3-digit number and tens.

**Resources**

* Base 10 materials (between two)

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# Lesson 14: Simple Subtracting

Textbook pages: 67 – 68

###### Lesson Objective

To be able to subtract multiples of 100 from a 3-digit number without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask the class if they know of any methods they could use to help solve this problem. How is today's problem similar to yesterday's problem? What is the main difference? Ask them which method they think will be most efficient in solving today's problem. Which method works but might be the most tedious?

Allow pupils to discuss this and show their thinking. Tell them your friend said the best method to use is the number bond strategy. Is this true? What are the benefits of using this method? What might the difficulties be using it? Have a discussion with the class about each of the key methods: using Base 10 materials, number bonds, counting back in hundreds.

During Guided Practice, pupils are subtracting 1-, 2- and 3-digit numbers from a 3-digit number using a variety of methods.

**Misconceptions**

Pupils fail to recognise the key words in word problems and therefore complete the inappropriate operation.
Pupils start with the incorrect number in the equation and try to subtract a large number from a smaller number.

**Formative Assessment**

Pupils can use number bonds to subtract multiples of 100 from a 3-digit number without renaming.
Pupils can use fact families to subtract multiples of 100 from a 3-digit number without renaming.
Pupils can count back in hundreds.
Pupils can use number squares to count back in hundreds.

**Non-Negotiable**

Pupils can subtract a multiple of 100 from a 3-digit number without renaming, using any method.

**Variation**

Seeing the relationship between subtracting a 1-digit number and then its multiple of 10 and 100 from the same 3-digit number.

**National Curriculum**

Subtract numbers mentally, including: a 3-digit number and hundreds.

**Resources**

* Base 10 materials (between two)

# Lesson 15: Simple Subtracting

Textbook pages: 69 – 71

###### Lesson Objective

To be able to subtract two 3-digit numbers without renaming.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and ask them to use the methods they have learnt so far to solve this problem. Do all of the methods generate the same answer? Is there a way to check our answers to make sure they are correct? Use the picture of Base 10 materials to demonstrate the subtraction from the ones, then tens, then hundreds. Ask pupils if we can also show this subtraction process using the column method. Get them to write the subtraction sum using the column method. Ask them how they know which number to place above and which to place below. Guide them to apply their knowledge from previous lessons, subtracting from the ones first as regrouping may be needed.

During Guided Practice, pupils are using a variety of methods to solve subtraction problems.

**Misconceptions**

Pupils fail to recognise the key words in word problems and therefore complete the inappropriate operation.
Pupils start with the incorrect number in the equation and try to subtract a large number from a smaller number.

**Formative Assessment**

Pupils can use the column method to subtract two 3-digit numbers without renaming.
Pupils can use the column method to subtract a 2-digit number from a 3-digit number without renaming.

**Non-Negotiable**

Pupils can use the column method to subtract two 3-digit numbers without renaming.

**Variation**

Example 1: Subtracting using the column method.
Example 2: Subtracting using the column method where one of the numbers being taken away is zero.
Example 3: Subtracting a 3-digit number from a 2-digit number.
Examples 4–5: Subtracting a 3-digit number from a 3-digit number.

**National Curriculum**

Subtract numbers with up to 3 digits, using formal written methods of columnar subtraction.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 16: Subtracting with Renaming

Textbook pages: 72 – 73

###### Lesson Objective

To be able to subtract from a 3-digit number with the regrouping of 1 ten into 10 ones.

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**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Write the column method for 831 – 26 on the board. Ask pupils if they notice that the 3-digit number is placed above the 2-digit number and if they know why. Guide them to relate it to the subtraction equation, 831 – 26; the column method is essentially another way to present the subtraction equation. Ask pupils why 26 is aligned to the right and not to the left. Guide them to recall that the ones must be placed in the ones column and the tens must be placed in the tens column.

Provide pupils with Base 10 materials and ask them to represent 831 using the materials. Ask them to show how the 6 ones can be subtracted. Lead pupils to regroup 1 ten into 10 ones. Show the process of regrouping using the column method so that pupils can relate the 'crossing out' to regrouping. It is important here that pupils understand why they are crossing out the tens column and ones column and changing the numbers. Then proceed to subtract the ones, tens and hundreds.

During Guided Practice, pupils are practising using Base 10 materials to show when they need to rename and when they do not.

**Misconceptions**

Pupils regroup 1 ten into 10 ones regardless of the need.

**Formative Assessment**

Pupils can arrange the numbers correctly for subtraction using the column method.
Pupils can regroup 1 ten into 10 ones using the column method.
Pupils can change the digits accordingly after regrouping, using the column method.
Pupils can subtract a 2-digit number from a 3-digit number using the column method.

**Non-Negotiable**

Pupils can subtract a 2-digit number from a 3-digit number using the column method, with the regrouping of 1 ten into 10 ones.

**Variation**

Example 1: Subtracting two 3-digit numbers (a) without regrouping; (b) with regrouping.
Example 2: Subtracting a 2-digit number from a 3-digit number (a) without regrouping; (b) with regrouping.

**National Curriculum**

Subtract numbers with up to 3 digits, using formal written methods of columnar subtraction. Solve problems using number facts, place value and more complex subtraction.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 17: Subtracting with Renaming

Textbook pages: 74 – 75

###### Lesson Objective

To be able to subtract two 3-digit numbers with the regrouping of 1 hundred into 10 tens.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. After discussing the problem with the class, guide them to conclude that subtraction will help them find the solution. Provide them with Base 10 materials and ask them to represent 608. Ask them to show how 135 can be subtracted. After subtracting the ones, as there are 0 tens in 608, guide pupils to apply their knowledge from the previous lesson that 1 hundred can be regrouped into 10 tens. Then they can proceed to subtract the tens, then the hundreds.

Ask pupils to write the column method for this subtraction. Ask them if they can remember how regrouping was done for the 10 to ones; they can use the same method for regrouping 1 hundred into 10 tens. Get them to show you how it can be done. Help pupils to relate the column method to the concept by using concrete materials or pictures.

During Guided Practice, pupils are subtracting 2- and 3-digit numbers with renaming.

**Misconceptions**

Pupils regroup 1 hundred into 10 tens regardless of the need.

**Formative Assessment**

Pupils can arrange the numbers correctly for subtraction using the column method.
Pupils can regroup 1 hundred into 10 tens using the column method.
Pupils can change the digits accordingly after regrouping, using the column method.
Pupils can subtract a 2-digit number from a 3-digit number using the column method.

**Non-Negotiable**

Pupils can subtract two 3-digit numbers with the regrouping of 1 hundred into 10 tens.

**Variation**

Examples (a) and (b): Subtracting two 3-digit numbers, with regrouping.
Example (c): Subtracting a 2-digit number from a 3-digit number, with regrouping.
Example (d): Subtracting two 3-digit numbers, with regrouping.

**National Curriculum**

Subtract numbers with up to 3 digits, using formal written methods of columnar subtraction. Solve problems using number facts, place value and more complex subtraction.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 18: Subtracting with Renaming

Textbook pages: 76 – 77

###### Lesson Objective

To be able to subtract two 3-digit numbers with renaming.

Book Contents

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Write the column method for 520 – 269 and ask the class to show the subtraction using Base 10 materials. They should realise that they have to start regrouping 1 ten as there are 0 ones in 520. After subtracting the ones, they also need to regroup 1 hundred into 10 tens as there are not enough tens in 520. After subtracting the tens, they can proceed to subtract the hundreds as no regrouping is required. By now pupils should be quite familiar with regrouping and the column method and will be able to relate the concrete regrouping to the 'crossing out' in the column method.

During Guided Practice, pupils are practising subtraction with regrouping.

**Misconceptions**

Pupils regroup regardless of the need.

**Formative Assessment**

Pupils can arrange the numbers correctly for subtraction using the column method.
Pupils can regroup 1 ten into 10 ones using the column method.
Pupils can regroup 1 hundred into 10 tens using the column method.
Pupils can change the digits accordingly after regrouping using the column method.
Pupils can subtract a 2-digit number from a 3-digit number using the column method.
Pupils can subtract a 3-digit number from a 3-digit number using the column method.

**Non-Negotiable**

Pupils can subtract two 3-digit numbers with the regrouping of tens and hundreds.

**Variation**

Examples (a) and (c): Subtracting a 2-digit number from a 3-digit number with regrouping of a ten and a hundred.
Examples (b) and (d): Subtracting a 3-digit number from a 3-digit number with regrouping of a ten and a hundred.

**National Curriculum**

Subtract numbers with up to 3 digits, using formal written methods of columnar subtraction. Solve problems using number facts, place value and more complex subtraction.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 19: Subtracting with Renaming

Textbook pages: 78 – 79

###### Lesson Objective

To be able to subtract from a multiple of 100 with renaming.

**Lesson Approach**

In this lesson, pupils learn to regroup twice before doing the subtraction. It involves regrouping the hundreds and then the tens before subtracting the ones. In these questions, pupils generally tend to lose perspective of the numbers used and focus instead on the procedure, therefore often making mistakes resulting in an unusual answer. It is important to remind pupils how a number is composed and allow them time to estimate so they can check their answer is close to their estimate.

To begin this lesson, show pupils the In Focus task and give them enough time to solve this problem by themselves in groups. Allow them to use Base 10 materials to represent 300. Then get them to start by subtracting the ones. They will need to regroup 1 ten as there is 0 ones in 300. However, there are also 0 tens in 300, therefore they have to regroup 1 hundred into 10 tens. Once there are 10 tens, pupils can regroup 1 ten into 10 ones. Then they can proceed to subtract. After they have the answer 175, ask them to use the column method to subtract. Did they get the same answer? If not, where did they go wrong? Ask them to check through the regrouping done on the column method to check they have done it correctly.

During Guided Practice, encourage pupils to use the column method and show the regrouping.

**Misconceptions**

Pupils regroup regardless of the need.

**Formative Assessment**

Pupils can arrange the numbers correctly for subtraction using the column method.
Pupils can regroup 1 ten into 10 ones using the column method.
Pupils can regroup 1 hundred into 10 tens using the column method.
Pupils can change the digits accordingly after regrouping using the column method.
Pupils can subtract a 2-digit number from a multiple of 100 using the column method.
Pupils can subtract a 2-digit number from a multiple of 100 using the column method.

**Non-Negotiable**

Pupils can subtract a 3-digit number from a multiple of 100 with regrouping of a ten and a hundred.

**Variation**

Examples (a) and (b): Subtracting a 2-digit number from a multiple of 100.
Examples (c) and (d): Subtracting a 3-digit number from a multiple of 100.

**National Curriculum**

Subtract numbers with up to 3 digits, using formal written methods of columnar subtraction. Solve problems using number facts, place value and more complex subtraction.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)

# Lesson 20: Using Models

Textbook pages: 80 – 82

###### Lesson Objective

To be able to solve word problems using addition and subtraction.

**Lesson Approach**

This is the first of four lessons on the bar model. Pupils have come across bar modelling in Year 2 and we will now build on their experience and competence.

To begin this lesson, show pupils the In Focus task. Ask them how they might come to the correct answer using cubes. Ask if the process can be represented using the squares in their exercise books/journals. Could 5 cubes be 5 squares and 3 cubes which represented 3 pencils be represented on paper with 3 squares?

Go on to explain that we do not always have to use one square to represent each unit. Show pupils that we can have a bar to represent 5 pencils and another bar to represent 3 pencils. Ask them how long the second bar should be if we are going to represent it as 3 pencils. Pupils should realise that the second bar should be shorter than the first as it represents fewer pencils. Help them recall that when we want to find the total, we can add the two parts, which are 5 and 3.

Show pupils the second question: 15 + 23. Guide them to see that it is similar to the previous one, except for the numbers involved. Ask them to try drawing a bar model to represent the problem. They can use the previous bar model as a reference. Once they have drawn a bar model, help them to label it and then proceed to find the number of pencils they have altogether.

During Guided Practice, pupils are solving problems with the help of bar models.

**Watch the Film**

**Misconceptions**

Pupils cannot relate an operation to finding the unknown shown on the bar model.

**Formative Assessment**

Pupils can use concrete materials to represent items in a problem.
Pupils can draw a bar model to represent a number of items in a problem.
Pupils can label all parts of the bar model with numbers and words.
Pupils can determine what information is missing from a bar model.
Pupils can apply addition and subtraction strategies from the chapter to bar model scenarios.

**Non-Negotiable**

Pupils can represent simple addition and subtraction problems using the bar model.
Pupils can solve problems using the bar model provided.

**Variation**

Example 1: The problem is stated, bar model is drawn, solution required; using the part–whole model where the whole is unknown.
Example 2: The problem is stated, bar model is drawn, solution required; using the part–whole model where a part is unknown.

**National Curriculum**

Solve problems, including missing number problems, using number facts, place value and more complex addition.

**Resources**

* Linking cubes

# Lesson 21: Using Models

Textbook pages: 83 – 84

###### Lesson Objective

To be able to solve word problems using addition and subtraction.

Book Contents

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask them whether the bar model diagram they used yesterday would be helpful today. Tell them your friend said that this is a part–whole bar model. Show them a semi-constructed bar model, where the bar model has been constructed but not labelled and ask them to label it. Allow pupils some time to discuss what the whole amount is and what is being taken away. Guide them to relate subtraction to finding one of the parts. Then ask them how we might represent the same information using a number bond? How might this look using the column method?

During Guided Practice, pupils are solving word problems involving addition and subtraction. Encourage them to draw bar models to represent the problems.

**Misconceptions**

Pupils cannot relate an operation to finding the unknown shown on the bar model.

**Formative Assessment**

Pupils can use concrete materials to represent items in a problem.
Pupils can draw a bar model to represent a number of items in a problem.
Pupils can label all parts of the bar model with numbers and words.
Pupils can determine what information is missing from a bar model.
Pupils can apply addition and subtraction strategies from the chapter to bar model scenarios, including the number bond and column methods.

**Non-Negotiable**

Pupils can represent addition and subtraction problems using the bar model.
Pupils can solve word problems involving addition and subtraction using bar models.

**Variation**

Example 1: A part–whole model where the whole is missing; adding a two 2-digit number and a 3-digit number without renaming.
Example 2: A part–whole model where the whole is missing; adding a 3-digit number to a 3-digit number with renaming.
Example 3: A part–whole model where a part is missing; subtracting a 3-digit number from a multiple of 100 with renaming.
Example 4: A part–whole model where a part is missing; subtracting two 3-digit numbers with renaming.

**National Curriculum**

Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.

# Lesson 22: Using Models

Textbook pages: 85 – 86

###### Lesson Objective

To be able to solve 'more than' and 'fewer than' word problems using addition and subtraction.

**Lesson Approach**

To begin this lesson, show pupils a spider and an ant. Ask them if they know how many more legs a spider has. To do that, pupils must know how many legs a spider and an ant have. Draw a bar to represent the spider's legs, then draw another bar below it to represent the ant's legs and label the 2 bars. Help pupils to see where 'more legs' are represented on the bar model, then label that part of the model. Guide them to see that they can use subtraction to find the answer since we know both the number of spider's legs and ant's legs.

Show the class Let's Learn 2 and discuss the problem with them. Lead them to see that this problem is similar to the previous one, except the numbers used are different. Ask them to try drawing the bar model for this problem, then model the drawing for them on the board. Guide pupils to draw the first bar for Ruby, then another bar below it for Amira. Ask them if Amira's bar should be longer or shorter based on the information from the problem. Then lead pupils to label the bar model with the information given. Since we know the number of stickers Ruby and Amira each have, we can find out how many more by subtraction.

During Guided Practice, pupils are practising drawing comparison models to represent the problems.

**Misconceptions**

Pupils cannot identify the unknown on the model.
Pupils cannot relate an operation to finding the unknown shown on the bar model.

**Formative Assessment**

Pupils can use concrete materials to represent items in a problem.
Pupils can draw a bar model to represent a number of items in a problem.
Pupils can label all parts of the bar model with numbers and words.
Pupils can determine what information is missing from a bar model.
Pupils can apply addition and subtraction strategies from the chapter to bar model scenarios, including the number bond and column methods.
Pupils can use the part–whole bar model method for addition and subtraction.
Pupils can use the comparison bar model method for addition and subtraction.

**Non-Negotiable**

Pupils can represent 'more than' and 'fewer than' problems using the bar model.
Pupils can solve 'more than' and 'fewer than' word problems involving addition and subtraction using bar models.

**Variation**

Solving problems using a comparison model.
Example 1: Subtracting to find the answer.
Examples 2–3: Adding to find the answer.
Example 4: Subtracting to find the answer.

**National Curriculum**

Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.

# Lesson 23: Using Models

Textbook pages: 87 – 88

###### Lesson Objective

To be able to solve 'more than' and 'fewer than' word problems using addition and subtraction.

Book Contents

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. What is the question asking us to find? How can they draw a bar model to represent the information from the question? Would it be better to use a part–whole or comparison model? Why? Give pupils enough time to work on this together. After some discussion, ask a pupil to draw the bars for Box A and Box B. Then ask pupils to fill in as much information on their model as possible.

Try to guide pupils if they have missed anything that has been given in the question. Highlight the excess part of Bar A (compared to Box B). Ask the class how they can work out this part of the bar. If needed, remind them about the previous lesson, which looked at the legs of a spider and an ant. Ask pupils what calculation is needed to find out the excess in the bar representing Box A. Ask them what this section gives us. Make sure everyone is aware that it gives us how many more rubbers Box A has, but also how many fewer rubbers Box B has.

During Guided Practice, pupils are solving more word problems using comparison bar models.

**Watch the Film**

**Misconceptions**

Pupils cannot identify the unknown on the model.
Pupils cannot relate an operation to finding the unknown shown on the bar model.

**Formative Assessment**

Pupils can use concrete materials to represent items in a problem.
Pupils can draw a bar model to represent a number of items in a problem.
Pupils can label all parts of the bar model with numbers and words.
Pupils can determine what information is missing from a bar model.
Pupils can apply addition and subtraction strategies from the chapter to bar model scenarios, including the number bond and column methods.
Pupils can use the part–whole bar model method for addition and subtraction.
Pupils can use the comparison bar model method for addition and subtraction.

**Non-Negotiable**

Pupils can represent 'more than' and 'fewer than' problems using the bar model.
Pupils can solve 'more than' and 'fewer than' word problems involving addition and subtraction using bar models.

**Variation**

Solving problems using a comparison model. Bar model diagrams provided.
Example 1: Names of the bar models provided; numerical amounts missing.
Example 2: Looking for the larger amount.
Example 3: Looking for the smaller amount.

**National Curriculum**

Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.

# Lesson 24: Chapter Consolidation

Textbook pages: 89 – 90

###### Lesson Objective

To be able to apply knowledge of addition and subtraction to solve problems.

**Lesson Approach**

Mind Workout
Pupils form two 3-digit numbers and then subtract the numbers using the column method.

Maths Journal
Pupils create a word problem using the subtraction equation provided and show their solution using a bar model.

Self Check
Pupils complete this as a chapter summary and discuss what to do with their teacher if any boxes are not ticked.